Paper No. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RICHARD BARCHAS

Appeal No. 1998-2624
Application No. 08/696,578

ON BRIEF

Before KRATZ, DELMENDO and PAWLIKOWSKI, Administrative Patent Judges.

DELMENDO, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1 through 23, which are all of the claims pending in the subject application.

The subject matter on appeal relates to a process for the recovery of olefins from cracked gases. Further details of this appealed subject matter are recited in illustrative claims 1 and 23 reproduced below:

1. A process for the recovery of olefins from

cracked gases comprising:

(a) compressing the cracked gas to a pressure ranging from about 50 to about 250 psig to produce a compressed cracked gas stream;

(b) washing said compressed gas to remove acidic gases from said compressed cracked gas stream to produce a washed compressed cracked gas stream;

(c) selectively hydrogenating acetylenes and dienes contained in the washed compressed cracked gas stream to produce a hydrogenated washed compressed gas stream;

(d) scrubbing said hydrogenated washed compressed gas stream in an absorber tower with a scrubbing solution comprising a metallic salt to form a scrubbed gaseous stream rich in paraffins and hydrogen and a scrubbed liquid stream rich in olefins and rich scrubbing solution;

(e) stripping said scrubbed liquid stream in an olefin stripper to produce a stripped gas stream rich in olefins and a lean liquid stream;

(f) separating said stripped gas stream rich in olefins into at least one of an ethylene-rich product stream, a propylene-rich product stream and a butene-rich product stream.

23. A process for the recovery of olefins from cracked gases comprising:

(a) compressing the cracked gas to a pressure ranging from about 50 to about 250 psig to produce a compressed cracked gas stream;

(b) washing said compressed cracked gas to remove acidic gases from said compressed cracked gas stream to produce a washed compressed cracked gas stream;

(c) selectively hydrogenating acetylenes and

dienes contained in the washed compressed cracked gas stream to produce a hydrogenated washed compressed gas stream;

(d) scrubbing said hydrogenated washed compressed gas stream in an absorber tower with a scrubbing solution comprising a metallic salt to form a scrubbed gaseous stream substantially comprising hydrogen, methane, ethane, propane and butane; and scrubbed liquid stream substantially comprising ethylene, propylene, butylenes and scrubbing solution;

(e) stripping said scrubbed liquid stream in an olefin stripper to produce a stripped gas stream rich in olefins and a lean liquid stream; and

(f) separating said stripped gas stream rich in olefins into at least one of an ethylene-rich product stream, a propylene-rich product stream and a butene-rich product stream.

The examiner relies on the following prior art references as evidence of unpatentability:

Rupp	2,514,294	Jul. 4, 1950
Dunlop et al. (Dunlop)	3,401,112	Sep. 10, 1968
Montgomery	4,128,595	Dec. 5, 1978
Lendle et al. (Lendle)	4,810,798	Mar. 7, 1989
Mehra et al. (Mehra)	5,326,929	Jul. 5, 1994

The following grounds of rejection are presented for our review in this appeal:

I. Claims 1 through 3, 5 through 13, 20, and 23 under 35 U.S.C. § 103(a) as unpatentable over Mehra in view of Dunlop. (Examiner's answer, pages 4-6.)

II. Claims 12 and 13 under 35 U.S.C. § 103(a) as unpatentable over Mehra in view of Dunlop and further in view of Rupp. (Id. at page 6.)

III. Claim 4 under 35 U.S.C. § 103(a) as unpatentable over Mehra in view of Dunlop and further in view of Montgomery. (Id. at page 7.)

IV. Claims 14 through 19, 21, and 22 under 35 U.S.C. § 103(a) as unpatentable over Mehra in view of Dunlop and further in view of Lendle. (Id.)

We reverse the aforementioned rejections for reasons which follow.

Under 35 U.S.C. ' 103, the initial burden of establishing a prima facie case of obviousness rests on the examiner. In re Piasecki, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). In this case, it is our determination that the examiner has not met the initial burden of proof.

As pointed out by the appellants (appeal brief, page 8), appealed claim 1 recites the steps of "(d) scrubbing said hydrogenated washed compressed gas stream in an absorber tower

with a scrubbing solution comprising a metallic salt to form a scrubbed gaseous stream rich in paraffins and hydrogen and a scrubbed liquid stream rich in olefins and rich scrubbing solution; (e) stripping said scrubbed liquid stream in an olefin stripper to produce a stripped gas stream rich in olefins and a lean liquid stream..." Similar language is also recited in appealed claim 23, the only other independent claim.

The examiner relies on Mehra's abstract and Mehra's discussion of the prior art. (Examiner's answer, page 5.) However, the examiner admits that Mehra does not describe the use of a scrubbing solution comprising a metallic salt as recited in appealed claims 1 and 23. (Id.) Notwithstanding this difference, the examiner held as follows:

> It would have been obvious to one skilled in the art to modify the Mehra et al process in view of the teachings of Dunlop et al to remove the desired olefins because Dunlop et al disclose that the solution comprising cuprous nitrate and pyridine is not expensive if compared with other materials (col. 1, lines 34-47). [Id.]

According to the examiner, "Mehra et al do not limit what kind of absorbing solvent can be used for their demethanization absorber (column 3, lines 25-31) although a *physical* solvent is *preferred* (column 7, lines 28-32)." (Id. at page 8.) The examiner further explains:

> [I]t would have been obvious to one of ordinary skill in the art to employ the solvent disclosed by Dunlop to separate paraffins (including **methane**) from the gaseous mixture of olefins and paraffins and hydrogen in the Mehra et al demethanization absorber. This is because (1) the Dunlop et al absorbent solution is not expensive (2) it can separate paraffins (including methane) from the mixture of olefins and paraffins and especially, (3) since the Dunlop et al absorbent solution can separate olefin**s** from paraffin**s** including methane**, the additional conventional downstream separation step**s *** required/needed in the Mehra et al process such as separating ethylene (an olefin) from ethane (a paraffin) and separating propylene (olefin) from propane (a paraffin) can be **eliminated** or **reduced** to a smaller scale. [Id. at p. 9.]

Initially, we note that the examiner has combined Mehra's discussion of the prior art with Mehra's disclosure of the hydrogen and ethylene recovery process. However, the basis for mixing the two disclosures as if they related to exactly the same process is not entirely clear to us. Nevertheless, we are in substantial agreement with the appellant's arguments that the examiner's basic position is not well founded. (Appeal brief, pages 7 through 14; reply brief, pages 1-7.)

Mehra's abstract describes a process for contacting an olefins-containing feed gas stream, which has been freed of CO_2 and sulfur compounds, compressed, cooled, and dried, with a solvent in an intercooled and reboiled demethanizing absorber to produce a rich solvent bottom stream containing ethylene and heavier hydrocarbons and an absorber overhead stream. According

to Mehra, the absorber overhead stream is fed to a methane absorber which recovers a hydrogen product stream as overhead and produces a rich solvent stream as bottoms. Mehra's abstract further teaches:

> When recovering up to 50% of the incoming hydrogen, this rich solvent stream from the methane absorber is fed to the demethanizing absorber, but when recovering from 20% to 100% of the incoming hydrogen, this rich solvent stream is recycled in part to the demethanizing absorber and in part is fed to a methane stripper which sends its bottoms to the methane absorber and its overhead to an auto refrigerated recovery unit which removes H_2, CH_4, and CO as a fuel gas product and produces an ethylene and heavier stream. The rich solvent stream from the demethanizing absorber is separated in a solvent regenerator into an overhead stream of ethylene and heavier hydrocarbons and a bottom lean solvent stream for recycle to the methane absorber and then to the demethanizing absorber. The bottom stream of the recovery unit and the overhead stream of the solvent regenerator are combined to form an ethylene and heavier product stream.

By contrast, Dunlop's teachings are directed to an entirely different purpose. Specifically, Dunlop teaches various separation processes including the recovery of monoolefins from paraffins using various metal salts. (Column 1, lines 20-47.) From our perspective, neither Mehra nor Dunlop provides any evidence that one of ordinary skill in the art would have considered the separation process described in Dunlop to be interchangeable with, much less desirable over, the

demethanization step described in Mehra. In re Dembiczak, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999) ("[T]he best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references.").

Nor is there any evidence in the applied prior art to establish that one of ordinary skill in the art would have made such a substitution with a reasonable expectation of success, consistent with the objectives stated in Mehra. In re Vaeck, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991) (citing In re Dow Chemical Co., 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988).

Regarding Mehra's discussion of the prior art (column 2, line 26 to column 3, line 7), we note the following:

> A low-pressure debutanizing stripper is located in the compression train to remove C5 and heavier fractions from the cracked gas. . .
>
> The C3-and-lighter fraction is fed to the absorber column. The C2's and C3's are absorbed by the solvent while methane and lighter components, together with some ethylene, leave the top of the absorber. This overhead stream is fed to a small tail-end demethanizer where essentially all the C2's are recovered. [Col. 2, ll. 31-34, 58-63.]

In the appellant's claimed process, however, the feed into the absorber tower is not a "C3-and-lighter fraction." Instead, the feed is a "hydrogenated washed compressed gas stream" produced from steps (a) through (c) of appealed claim 1 or 23. The examiner's rejection does not account for this difference.

The remaining references have been applied only for the purpose of addressing the additional features recited in the dependent claims. However, they do not remedy the fundamental deficiencies in the examiner's combination of Mehra and Dunlop.

Because the examiner has not pointed to a specific teaching, motivation, or suggestion in the prior art to combine the references so as to arrive at the here claimed invention, we hold that the examiner has engaged in impermissible hindsight reconstruction using the appellant's own specification as a template. In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992); Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed. Cir. 1985); W. L. Gore & Assoc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983).

In summary, the examiner's rejections of (i) claims 1 through 3, 5 through 13, 20, and 23 under 35 U.S.C. § 103(a) as unpatentable over Mehra in view of Dunlop, (ii) claims 12 and 13

under 35 U.S.C. § 103(a) as unpatentable over Mehra in view of Dunlop and further in view of Rupp, (iii) claim 4 under 35 U.S.C. § 103(a) as unpatentable over Mehra in view of Dunlop and further in view of Montgomery, and (iv) claims 14 through 19, 21, and 22 under 35 U.S.C. § 103(a) as unpatentable over Mehra in view of Dunlop and further in view of Lendle are reversed.

The decision of the examiner is reversed.

REVERSED

PETER F. KRATZ Administrative Patent Judge	)
ROMULO H. DELMENDO Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND) INTERFERENCES
BEVERLY A. PAWLIKOWSKI Administrative Patent Judge	)

rhd/ki

ALAN B CLEMENT
HEDMAN GIBSON & COSTIGAN PC
1185 AVENUE OF THE AMERICAS
NEW YORK NY 10036